Enemy Swim Lake

Site Description

Location

Water designation number (WDN)	22-0006-00
Legal description	T123N-R53W-Sec.10-16
County (ies)	Day
Location from nearest town	1.5 miles east and 6.5 miles north of Waubay, SD

Survey Dates and Sampling Information

Survey dates	July 23-25, 2013 (FN, GN) September 11, 2013 (EF-WAE)
Frame net sets (n)	24
Gill net sets (n)	6
Electrofishing-WAE (min)	60

Morphometry (Figure 1)

Watershed area (acres)	22,310
Surface area (acres)	2,146
Maximum depth (ft)	26
Mean depth (ft)	16

Ownership and Public Access

Enemy Swim Lake is a meandered lake owned by the State of South Dakota and the fishery is managed by the SDGFP. Two public access sites are located on Enemy Swim Lake (southwest and south shore) and each is maintained by the SDGFP (Figure 1; Figure 2). Lands adjacent to Enemy Swim Lake are owned by the State of South Dakota, Bureau of Indian Affairs, and private individuals.

Watershed and Land Use

Land use within the Enemy Swim Lake watershed is primarily agricultural with a mix of pasture or grassland, cropland, and woodlands (e.g., shelterbelts).

Water Level Observations

The South Dakota Water Management Board established OHWM is 1854.4 fmsl, and the outlet elevation of Enemy Swim Lake is 1853.6 fmsl. On May 21, 2013 the elevation was 1854.0 fmsl; 1.2 ft. higher than fall 2012 elevation of 1852.8 fmsl. Water levels had declined to an elevation of 1852.8 fmsl by October 8, 2013.

Fish Management Information

Primary species	Black Crappie, Bluegill, Largemouth Bass, Smallmouth Bass, Walleye, Yellow Perch
Other species	Black Bullhead, Common Carp, Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, White Bass, White Sucker
Lake-specific regulations	Smallmouth/Largemouth bass: Only those less than 14", or 18" and longer may be taken. Of those no more than one may be 18" or longer. Walleye: minimum length 15".
Management classification	warm-water permanent
Fish consumption advisories	none

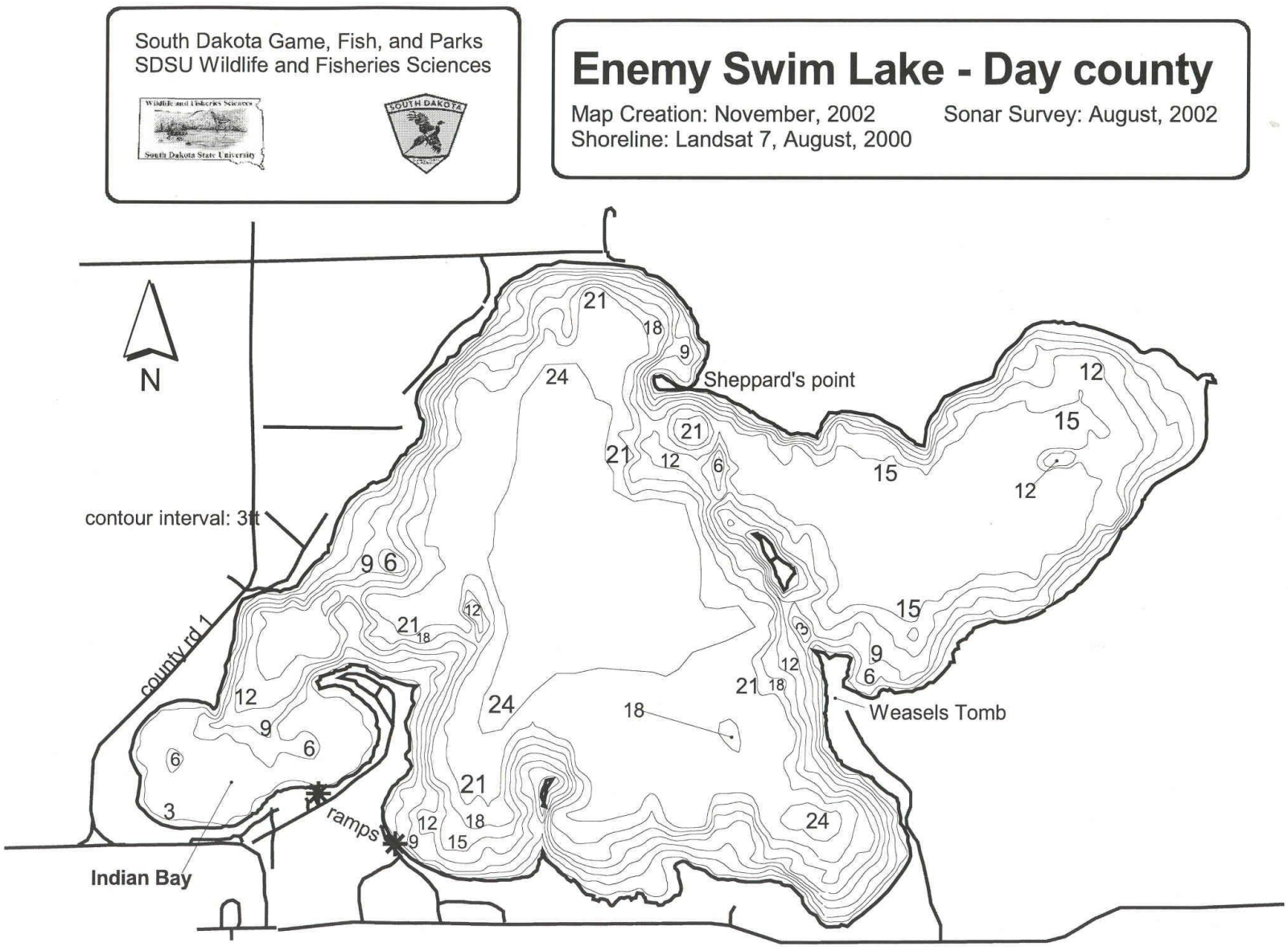

Figure 1. Map depicting access locations and depth contours for Enemy Swim Lake, Day County, South Dakota.

Figure 2. Map depicting the location of several Day County, South Dakota lakes including Enemy Swim (top). Also noted are public access sites and standardized net locations for Enemy Swim Lake. EFN= frame nets; EGN=gill nets

Management Objectives

1) Maintain a mean frame net CPUE of stock-length Black Crappie ≥ 10, a PSD of 30-60, and a PSD-P of 5-10.

2) Maintain a mean frame net CPUE of stock-length Bluegill ≥ 25, a PSD of 30-60, and a PSD-P of 5-10.

3) Maintain a mean spring night electrofishing CPUE of stock-length Largemouth Bass ≥ 30, a PSD of 40-70, and a PSD-P of 10-40.

4) Maintain a moderate density Smallmouth Bass population with a PSD of 40-70 and a PSD-P of 10-40.

5) Maintain a mean gill net CPUE of stock-length Walleye ≥ 10, a PSD of 30-60, and a PSD-P of 5-10.

6) Maintain a mean gill net CPUE of stock-length Yellow Perch ≥ 30, a PSD of 30-60, and a PSD-P of 5-10.

Results and Discussion

Enemy Swim Lake is a natural lake with a moderately-sized watershed. Major surface water inlets to Enemy Swim Lake include Lewandowski Creek at the northeast and Burns Slough at the southeast. Water exiting Enemy Swim Lake drains into Campbell Slough from there it flows into Blue Dog Lake and then into a series of connected lakes (Rush Lake, Minnewasta Lake, Waubay Lake and Bitter Lake).

Portions of the Enemy Swim Lake shoreline are highly developed (i.e., south, west and northeast corner of East Lake); while other areas remain relatively undeveloped. Enemy Swim Lake supports one of the most diverse fish assemblages in northeast South Dakota. Currently, Enemy Swim Lake is primarily managed as a panfish (i.e., Black Crappie, Bluegill, and Yellow Perch), black bass (Largemouth and Smallmouth), and Walleye fishery.

Primary Species

Black Crappie: The mean frame net CPUE of stock-length Black Crappie was 5.7 (Table 1) and below the minimum objective (≥ 10 stock-length Black Crappie/net night; Table 3). The 2013 frame net CPUE represented an increase from the 2012 CPUE of 2.1 (Table 2). Currently, Black Crappie relative abundance is considered moderate.

Black Crappies captured in frame nets ranged in TL from 19 to 29 cm (7.5 to 11.4 in), had a PSD of 99 and PSD-P of 46 (Table 1; Figure 3). Both the PSD and PSD-P

were above management objective ranges indicating a population dominated by Black Crappie ≥ quality-length (i.e., 20 cm; 8 in; Table 3; Figure 3).

No growth information was collected. A decreasing trend in condition was apparent as TL increased. However, frame net captured Black Crappie had acceptable condition with mean Wr values that remained ≥ 90 for all cm-length groups represented.

Bluegill: The mean frame net CPUE of stock-length Bluegill was 54.2 (Table 1) and well above the minimum objective (≥ 25 stock-length Bluegill/net night; Table 3). Since 2004, frame net mean CPUE values of stock-length Bluegill have ranged from a low of 39.7 (2004) to a high of 90.2 (2011; Table 2). Based on the 2013 frame net CPUE, relative abundance is high.

Frame net captured Bluegill ranged in TL from 7 to 22 cm (2.8 to 8.7 in) with a high proportion being ≥ quality-length (15 cm; 6 in; Figure 4). The PSD was 68 and the PSD-P was 32; both exceeded management objectives of 30-60 and 5-10, respectively (Table 1; Table 3).

Since 2005, otoliths have been collected from a sub-sample of frame net captured Bluegill. Age structure analysis suggests that Bluegill tend to exhibit consistent recruitment in Enemy Swim Lake (Table 4). In 2013, eight consecutive year classes (2005-2012) were present in the frame net sample (Table 4). Cohorts produced in 2007, 2008, and 2010 were the most abundant and collectively comprised 77% of Bluegill in the frame net catch (Table 4).

Bluegill in Enemy Swim Lake typically approach or surpass quality-length (15 cm; 6 in) by age-5 (Table 5). Since 2005, weighted mean TL at capture values of age-5 Bluegill have ranged from 141 to 190 mm (5.6 to 7.5 in; Table 5). In 2013, the weighted mean TL at capture for age-5 individuals was 190 mm (7.5 in; Table 5). Frame net captured Bluegill had mean Wr values that ranged from 96 to 107 for all length categories (e.g., stock to quality) sampled. An increasing trend in condition was apparent as TL increased. Seasonal influences (i.e., spawning behavior) may have influenced Wr values.

Largemouth bass: Largemouth bass populations are typically assessed using night electrofishing conducted during June when water temperatures are approximately 65ºF in northeastern South Dakota. Spring night electrofishing to monitor the largemouth bass population will be conducted biennially during even years (e.g., 2012, 2014, 2016…).

Smallmouth bass: Prior to 2009, fall night electrofishing was used to assess smallmouth bass populations in northeast South Dakota. However, recent research has recommended that smallmouth bass population dynamics be monitored utilizing standardized spring (May and June) night electrofishing over suitable habitat (i.e., rocky substrate) in northeast South Dakota glacial lakes (Bacula 2009). Spring night electrofishing to monitor the smallmouth bass population will be conducted biennially during even years (e.g., 2014, 2016, 2018…).

Walleye: The mean gill net CPUE of stock-length Walleye was 8.7 (Table 1) and below the minimum objective (≥ 10 stock-length Walleye/net night; Table 3). Since 2004, the mean gill net CPUE has ranged from a low of 3.0 (2008) to a high of 18.2

(2005; Table 2). The 2013 gill net CPUE was slightly higher than the 2012 CPUE of 7.5 (Table 2) and suggested moderate relative abundance.

Walleye in the gill net catch ranged in TL from 18 to 65 cm (7.1 to 25.6 inches) with the majority being in the stock-quality length category (Figure 5). The PSD was 21 and below the management objective of 30-60; while the PSD-P of 17 was above the management objective of 5-10 (Table 1; Table 3; Figure 5). Approximately 20% of Walleye in the gill net catch were above the 381-mm (15-inch) minimum length restriction (Figure 5).

Otoliths were collected from a sub-sample of gill net captured Walleye in 2013. Ten year classes (1997, 1999, 2002-2006, and 2009-2011) were present in the gill net catch. The 2009 year class, which coincided with a large fingerling stocking, was the most represented and comprised 54% of Walleye in the gill net catch (Table 6; Table 8). With the exception of the 2009 cohort, recruitment has been limited in recent years (Table 6). Fall electrofishing indicated that relatively strong year-classes (defined as > 20 age-0 Walleye/hour) were naturally produced from 2006-2008; however, few individuals from these year classes were sampled in later surveys (Table 2; Table 6). In 2013, small fingerlings were stocked to supplement the population; mean fall night electrofishing in conjunction with oxytetracycline (OTC) marking revealed that a strong year class was produced by the stocking (Table 1; Table 6; Table 8). However, recruitment of the 2013 cohort is currently unknown and will be assessed in future surveys.

Walleye growth in Enemy Swim Lake tends to be highly variable (Table 7). Since 2005, the weighted mean length at capture for age-3 Walleye has ranged from 288 to 411 mm (11.3 to 16.2 in; Table 7). Due to low sample sizes weighted mean TL at capture values may at times represent a single Walleye (Table 7). The 2009 cohort had weighted mean TL at capture values of 320 and 334 mm (12.6 and 13.1 in) at age 3 and 4 (Table 7). The majority of gill net captured Walleye were in the stock-quality length category, which had a mean Wr of 81.

Yellow Perch: The mean gill net CPUE of stock-length Yellow Perch was 9.7 (Table 1) and below the minimum objective (≥ 30 stock-length Yellow Perch/net night; Table 3). Since 2004, the mean gill net CPUE has ranged from a low of 4.5 (2008) to a high of 152.2 (2011; Table 2). Mean CPUE values have declined in each of the past two surveys (i.e., 2012 and 2013; Table 2). Currently, relative abundance is low to moderate.

Yellow Perch in the gill net catch ranged in TL from 9 to 18 cm (3.5 to 7.1 in), with few being ≥ quality-length (20 cm; 8 in; Figure 6). The PSD was 2 and the PSD-P was 0; both were below management objectives (Table 1; Table 3).

Otoliths collected from a sub-sample of gill net captured Yellow Perch revealed the presence of six consecutive year classes (2007-2012; Table 9). The 2008 and 2009 cohorts were the most represented and comprised 45% and 30%, respectively, of Yellow Perch in the gill net catch (Table 9).

Yellow Perch in Enemy Swim Lake tend to grow slow. Since 2009, weighted mean TL at capture values for age-3 Yellow Perch have ranged from 124 to 166 mm (4.9 to 6.5 in); while age-4 fish had weighted mean TL at capture values that ranged from 157 to 222 mm (6.2 to 8.7 in), when males and females were combined (Table 10). However, due to low sample sizes weighted mean TL at capture values may at times

represent few individuals (Table 10). As with most populations, males tend to be smaller at a given age than females, particularly at older ages (Table 10). Yellow Perch in the stock-quality length category dominated the gill net catch and had mean Wr value of 91.

Other Species

Black Bullhead: Relative abundance has remained low, with mean frame net CPUE values for stock-length Black Bullheads of < 3.0 from 2004-2013 (Table 2). In 2013, frame nets captured four stock-length Black Bullheads that ranged in TL from 29 to 33 cm (11.4 to 13.0 in). The mean frame net CPUE was 0.2 (Table 1) and within the management objective (≤ 100 stock-length Black Bullhead/net night; Table 3). Relatively high predator abundance provided by several species of predatory fish (i.e., Walleye, Largemouth and Smallmouth bass) likely aids in maintaining the low abundance of Black Bullhead in Enemy Swim Lake.

Northern Pike: Northern Pike typically are not sampled effectively during standardized mid-summer fish community surveys. As a result, mean gill net CPUE values are often low. In 2013, gill nets captured six Northern Pike that ranged in TL from 56 to 85 cm (22.0 to 33.5 in). The mean gill net CPUE of stock-length Northern Pike was 1.0 (Table 1). Since 2004, mean gill net CPUE values have ranged from 0.5 (2007) to 3.7 (2012; Table 2). Currently, relative abundance is considered low to moderate.

No age or growth information was collected. Few inferences can be made concerning size structure or condition due to the low sample size.

Rock Bass: Rock Bass were the third most abundant species in the frame net catch behind Bluegill and Black Crappie (Table 1). The mean frame net CPUE of stock-length Rock Bass was 3.8 (Table 1). Since 2004, frame net CPUE values have ranged from a low of 3.8 (2013) to a high of 14.0 (2006; Table 2).

Length-frequency analysis indicated consistent recruitment, as frame net captured Rock Bass ranged in TL from 10 to 26 cm (3.9 to 10.2 in) with nearly all 1-cm length groups being represented (Figure 7). The PSD was 63 and the PSD-P was 22 (Table 1; Figure 7). No age or growth information was collected. Rock Bass in the frame net catch had a mean Wr of 98 for each of the length categories (e.g., stock to quality) sampled.

Other: Pumpkinseed, White Bass, and White Sucker were other fish species captured during the 2013 fish community survey (Table 1).

Management Recommendations

1) Conduct fish community assessment surveys utilizing frame nets and gill nets on an annual basis (next survey scheduled in summer 2014) to monitor fish relative abundance, fish population size structures, fish growth, and stocking success.

2) Conduct spring night electrofishing biennially (even years) to monitor Largemouth and Smallmouth bass population parameters.

3) Conduct fall night electrofishing on an annual basis to monitor age-0 Walleye relative abundance.

4) Collect otoliths from Bluegill, Walleye, and Yellow Perch; scales from Largemouth and Smallmouth bass to assess the age structure and growth rates of each population.

5) Stock Walleye at (≈25 large fingerling/acre) to establish additional year classes if fall night electrofishing CPUE of age-0 Walleye and gill netting results warrant [i.e., low gill net CPUE of sub-stock (< 25 cm; 10 in) Walleye and/or fall night electrofishing CPUE < 75 age-0 Walleye/hour].

6) Maintain the 356-457 mm (14-18 in) protected slot length limit on Largemouth and Smallmouth Bass. The regulation is designed to increase the average size of black bass while allowing harvest of small bass to avoid slowing of growth (Blackwell and Lucchesi 2009).

7) Maintain the 381-mm (15 in) minimum length limit on Walleye. The regulation is designed to protect smaller fish from harvest and increase average fish size (Lucchesi and Blackwell 2009).

8) Partner with willing landowners on shoreline restoration projects designed to restore native plant fauna along highly-developed shorelines providing improvements to water quality and littoral habitats within the lake.

Table 1. Mean catch rate (CPUE; frame/gill nets= catch/net night, electrofishing= catch/hour) of stock-length fish, proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) of stock-length fish for various fish species captured in gill nets, frame nets, and electrofishing in Enemy Swim Lake, 2013. Confidence intervals include 80 percent (± CI-80) or 90 percent (± CI-90). BLB= Black Bullhead; BLC= Black Crappie; BLG= Bluegill; NOP= Northern Pike; PUS= Pumpkinseed; ROB= Rock Bass; SMB= Smallmouth Bass; WAE= Walleye; WHB= White Bass; WHS= White Sucker; YEP= Yellow Perch

	Abundance		Stock Density Indices				Condition	
Species	CPUE	CI-80	PSD	CI-90	PSD-P	CI-90	Wr	CI-90
Frame nets								
BLB	0.2	0.1	100	0	75	59	84	6
BLC	5.7	1.3	99	1	46	7	100	1
BLG	54.2	10.5	68	3	32	2	103	1
NOP	0.4	0.2	80	24	40	30	82	3
PUS	2.1	1.1	46	12	0	---	106	1
ROB	3.8	0.9	63	8	22	7	98	0
SMB	3.4	0.8	46	10	21	8	90	1
WAE	0.7	0.3	29	20	12	14	82	2
WHB	0.1	0.1	100	0	100	0	86	6
WHS	0.2	0.1	100	0	80	43	93	9
YEP	1.1	0.6	8	9	0	---	84	1
Gill nets								
BLC	8.5	3.3	100	0	65	12	104	1
BLG	41.8	22.8	91	3	26	5	107	<1
NOP	1.0	0.5	100	0	50	45	84	3
PUS	0.3	0.3	50	50	0	---	114	<1
ROB	2.7	2.1	88	15	19	18	102	4
SMB	2.3	0.7	21	21	14	17	93	4
WAE	8.7	2.3	21	10	17	9	80	1
WHB	5.8	5.8	100	0	83	11	87	1
WHS	2.2	0.9	100	0	100	0	100	2
YEP	9.7	5.9	2	3	0	---	91	<1
Electrofishing								
WAE[1]	116.0	16.0	---	---	---	---	---	---

[1] Fall night electrofishing-WAE; catch rate (CPUE) represents age-0 Walleye/hour

Table 2. Historic mean catch rate (CPUE; frame/gill nets= catch/net night, electrofishing= catch/hour) of stock-length fish for various fish species captured in gill nets, frame nets, and electrofishing in Enemy Swim Lake, 2004-2013. BLB= black bullhead; BLC= Black Crappie; BLG= Bluegill; COC= Common Carp; LMB= Largemouth Bass; NOP= Northern Pike; PUS= Pumpkinseed; ROB= Rock Bass; SMB= Smallmouth Bass; WAE= Walleye; WHB= White Bass; WHS= White Sucker; YEP= Yellow Perch

	CPUE									
Species	2004	2005	2006[1]	2007[1]	2008	2009	2010	2011	2012	2013
Frame nets										
BLB	2.8	2.6	1.0	0.4	0.1	0.1	0.1	0.5	0.3	0.2
BLC	1.5	1.0	2.3	0.8	0.0	0.2	1.3	8.3	2.1	5.7
BLG	39.7	51.3	56.0	42.5	65.3	56.8	57.3	90.2	53.8	54.2
COC	<0.1	0.0	0.0	<0.1	0.1	<0.1	0.0	0.1	<0.1	0.0
LMB	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0
NOP	0.4	0.4	0.1	0.3	0.3	0.1	0.3	0.3	0.3	0.4
PUS	0.9	3.1	1.7	<0.1	0.5	0.3	1.7	2.3	0.6	2.1
ROB	11.0	9.6	14.0	8.6	11.5	8.3	5.3	12.7	8.2	3.8
SMB	1.9	2.1	6.3	1.3	2.7	1.8	1.9	14.9	4.6	3.4
WAE	0.4	0.2	0.3	0.3	0.4	0.1	<0.1	0.6	1.2	0.7
WHB	0.1	0.1	0.3	0.5	<0.1	<0.1	<0.1	0.1	0.2	0.1
WHS	0.1	0.1	0.0	0.3	0.1	0.1	0.2	0.1	0.1	0.2
YEP	0.5	2.3	4.4	3.5	<0.1	1.6	5.1	7.4	0.9	1.1
Gill nets										
BLB	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BLC	15.8	4.2	2.8	1.5	0.3	0.0	2.0	2.0	4.0	8.5
BLG	19.7	12.5	8.7	5.8	0.5	2.8	3.8	2.5	54.8	41.8
COC	0.3	0.0	1.2	1.8	0.2	0.5	0.2	0.3	1.2	0.0
NOP	2.8	1.2	1.2	0.5	1.2	2.0	1.3	2.8	3.7	1.0
PUS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3
ROB	4.5	1.8	2.3	14.0	2.0	3.3	1.2	0.2	0.7	2.7
SMB	3.5	5.0	1.2	1.8	2.2	4.2	0.7	1.5	2.7	2.3
WAE	11.0	18.2	13.5	14.7	3.0	4.7	5.7	10.8	7.5	8.7
WHB	0.5	0.0	0.7	1.5	2.5	2.7	0.3	1.8	8.0	5.8
WHS	3.7	3.0	4.0	1.7	3.5	4.5	7.7	3.3	1.5	2.2
YEP	19.2	18.0	19.8	14.3	4.5	40.5	112.3	152.2	34.0	9.7
Electrofishing										
LMB[2]	131.5	84.4	202.0	---	102.2	81.7	112.1	---	67.2	---
SMB[3]	---	---	---	---	---	123.7	107.0	---	299.0	---
WAE[4]	1.0	8.7	21.0	38.5	52.6	8.2	34.7	25.0	3.0	116.0

[1] Monofilament gill net mesh size change (0.75", 1.00", 1.25", 1.50", 2.00" and 2.50")
[2] Spring night electrofishing-LMB
[3] Spring night electrofishing-SMB.
[4] Fall night electrofishing-WAE; catch rate (CPUE) represents age-0 Walleye/hour

Table 3. Mean catch rate (CPUE; frame/gill nets= catch/net night, electrofishing= catch/hour), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish, and mean relative weight (Wr) for selected species captured in experimental gill nets, frame nets, and electrofishing in Enemy Swim Lake, 2004-2013. BLC= Black Crappie; BLG= Bluegill; LMB= Largemouth Bass; SMB= Smallmouth Bass; WAE= Walleye; YEP= Yellow Perch

Species	2004	2005	2006[3]	2007[3]	2008	2009	2010	2011	2012	2013	Objective
Frame nets											
BLC											
CPUE	2	1	2	1	0	<1	1	8	2	6	≥ 10
PSD	97	84	64	56	---	20	23	84	84	99	30-60
RSD-P	31	84	53	39	---	20	16	5	57	46	5-10
Wr	107	110	99	94	---	106	101	104	95	100	---
BLG											
CPUE	40	51	56	43	65	57	57	90	54	54	≥ 25
PSD	47	18	34	15	29	15	41	61	78	68	30-60
RSD-P	16	14	7	1	3	4	7	0	7	32	5-10
Wr	130	116	109	100	106	101	100	102	107	103	---
Gill nets											
WAE											
CPUE	11	18	14	15	3	5	6	11	8	9	≥ 10
PSD	27	12	57	63	61	96	56	14	18	21	30-60
RSD-P	3	6	7	14	17	18	9	5	9	17	5-10
Wr	84	85	87	89	88	91	92	85	81	80	---
YEP											
CPUE	19	18	20	14	5	41	112	152	34	10	≥ 30
PSD	57	35	24	8	4	0	0	1	3	2	30-60
RSD-P	12	12	5	1	4	0	0	0	0	0	5-10
Wr	96	94	96	93	99	97	97	91	93	91	---
Electrofishing											
LMB [1]											
CPUE	131	84	202	---	102	82	112	---	67	---	≥ 30
PSD	63	80	59	---	81	91	99	---	86	---	40-70
RSD-P	9	5	6	---	29	45	55	---	79	---	10-40
Wr	105	106	108	---	104	105	109	---	107	---	---
SMB [2]											
CPUE	---	---	---	---	---	124	107	---	299	---	---
PSD	---	---	---	---	---	7	72	---	8	---	40-70
RSD-P	---	---	---	---	---	6	41	---	3	---	10-40
Wr	---	---	---	---	---	87	95	---	83	---	---

[1] Spring night electrofishing-LMB.
[2] Spring night electrofishing-SMB.
[3] Monofilament gill net mesh size change (0.75”, 1.00”, 1.25”, 1.50”, 2.00” and 2.50”)

Table 4. Year class distribution based on the expanded age/length summary for Bluegill sampled in frame nets from Enemy Swim Lake, 2010-2013.

	Year Class										
Survey Year	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
2013		12	91	327	124	248	431	76	14		
2012	---			54	63	357	530	128	112	45	
2011	---	---				265	504	669	727		
2010[1]	---	---	---			57	196	307	728	77	6

[1] Older Bluegill were sampled, but are not reported in this table.

Table 5. Weighted mean TL (mm) at capture for Bluegill age-1 through age-9 sampled in frame nets (expanded sample size) from Enemy Swim Lake, 2005-2013.

	Age								
Year	1	2	3	4	5	6	7	8	9
2013	92(12)	84(91)	115(327)	172(124)	190(248)	199(431)	201(76)	215(14)	---
2012	---	93(54)	124(63)	158(357)	176(530)	192(128)	193(112)	199(45)	---
2011	---	---	107(265)	131(504)	172(669)	183(727)	---	---	---
2010[1]	---	91(57)	105(196)	129(307)	153(728)	212(77)	217(6)	---	---
2008	---	---	105(811)	149 519)	161(152)	173(34)	199(21)	227(6)	249(20)
2007	---	91(285)	113(306)	133(365)	149(88)	180(6)	---	240(6)	---
2006[1]	---	94(58)	112(232)	110(246)	145(565)	176(161)	220(17)	227(60)	242(3)
2005	---	76(5)	87(122)	104(843)	141(71)	193(51)	219(76)	---	237(5)

[1] Older Bluegill were sampled, but are not reported in this table.

Table 6. Year class distribution based on the expanded age/length summary for Walleye sampled in gill nets and associated stocking history (# stocked x 1,000) from Enemy Swim Lake, 2009-2013.

	Year Class													
Survey Year	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
2013[1]			6	10	30			1	1	1	1	3		
2012[1]	---		3	1	40				1		1		1	
2011	---	---		3	61	1	2		2			2		
2010[1]	---	---	---		52	13	1	3	4			3	3	3
2009[1]	---	---	---	---		1	1	1	4		6	8	3	2
# stocked														
fry														
sm. fingerling	217[2]		236											439
lg. fingerling			39		15				58			12		

[1] Older Walleye were sampled, but are not reported in this table.

[2] 87% of stocked Walleye were OTC marked; 43 of 54 otoliths (80%) collected from fall electrofished age-0 Walleye exhibited marks. Chi-Square analysis indicated no significant difference in the proportion observed verses the proportion stocked (p-value=0.105); concluded that 2013 year class was largely produced by stocking. The estimated stocking contribution was 92%.

Table 7. Weighted mean TL at capture (mm) for Walleye age-1 through age-10 sampled in experimental gill nets (expanded sample size) from Enemy Swim Lake, 2005-2013. Note: sampling was conducted at approximately the same time during each year allowing comparisons among years to monitor growth trends.

	Age									
Year	1	2	3	4	5	6	7	8	9	10
2013[1]	---	224(6)	288(10)	334(30)	---	---	559(1)	565(1)	559(1)	602(1)
2012[1]	167(3)	260(1)	320(40)	---	---	---	552(1)	---	636(1)	---
2011[1]	209(3)	298(61)	399(1)	480(2)	---	479(2)	---	---	536(2)	---
2010[1]	210(52)	311(13)	402(1)	446(3)	445(4)			478(3)	493(3)	542(3)
2009[1]	198(1)	311(1)	411(1)	426(4)	---	472(6)	484(8)	467(3)	482(2)	625(1)
2008[1]	176(2)	259(1)	356(8)	---	---	485(1)	465(3)	421(1)	531(2)	---
2007[1]	180(1)	273(26)	329(6)	407(7)	430(16)	447(11)	500(5)	525(7)	504(3)	560(2)
2006[1]	198(10)	255(6)	336(12)	378(28)	411(16)	420(2)	466(6)	432(1)	482(1)	502(8)
2005	190(2)	261(9)	313(48)	341(39)	379(7)	452(3)	---	576(3)	564(2)	460(1)

[1] Older Walleye were sampled, but are not reported in this table.

Table 8. Stocking history including size and number for fishes stocked into Enemy Swim Lake, 1999-2012. LMB= Largemouth Bass; WAE= Walleye

Year	Species	Size	Number
2000	WAE	small fingerling	439,450
2002	WAE	juvenile	2,971
2002	WAE	large fingerling	9,388
2005	WAE	large fingerling	57,791
2006	LMB	fingerling	116,460
2009	WAE	large fingerling	14,949
2011	WAE	small fingerling	235,640
2011	WAE	large fingerling	38,634
2013	WAE	small fingerling	217,450

Table 9. Year class distribution based on the age/length summary for Yellow Perch sampled in gill nets from Enemy Swim Lake, 2009-2013.

	Year Class								
Survey Year	2013	2012	2011	2010	2009	2008	2007	2006	2005
2013		11	1	2	21	32	4		
2012	---		2	7	20	168	18		
2011	---	---			682	811	112		
2010	---	---	---		25	1517	277	7	
2009	---	---	---	---		241	636	35	1

Table 10. Weighted mean TL (mm) at capture by gender for Yellow Perch captured in experimental gill nets (expanded sample size) from Enemy Swim Lake, 2009-2013.

	Age					
Year	1	2	3	4	5	6
2013						
Male	98(4)	112(1)	---	155(1)	155(6)	175(1)
Female	97(7)	---	139(2)	157(22)	173(24)	165(2)
Combined	97(11)	112(1)	139(2)	157(21)	168(32)	170(4)
2012						
Male	---	112(2)	132(3)	153(37)	---	---
Female	101(2)	111(5)	146(20)	170(124)	185(22)	---
Combined	101(2)	111(7)	144(20)	165(168)	189(18)	---
2011						
Male	---	107(301)	142(181)	165(14)	---	---
Female	---	110(328)	152(664)	180(60)	---	---
Combined	---	109(682)	149(811)	171(112)	---	---
2010						
Male	93(14)	114(569)	152(29)	---	---	---
Female	95(7)	126(890)	170(219)	200(7)	---	---
Combined	94(25)	120(1517)	166(277)	200(7)	---	---
2009						
Male	98(72)	116(97)	103(15)	---	---	---
Female	102(87)	127(532)	169(11)	222(1)	---	---
Combined	100(241)	126(636)	124(35)	222(1)	---	---

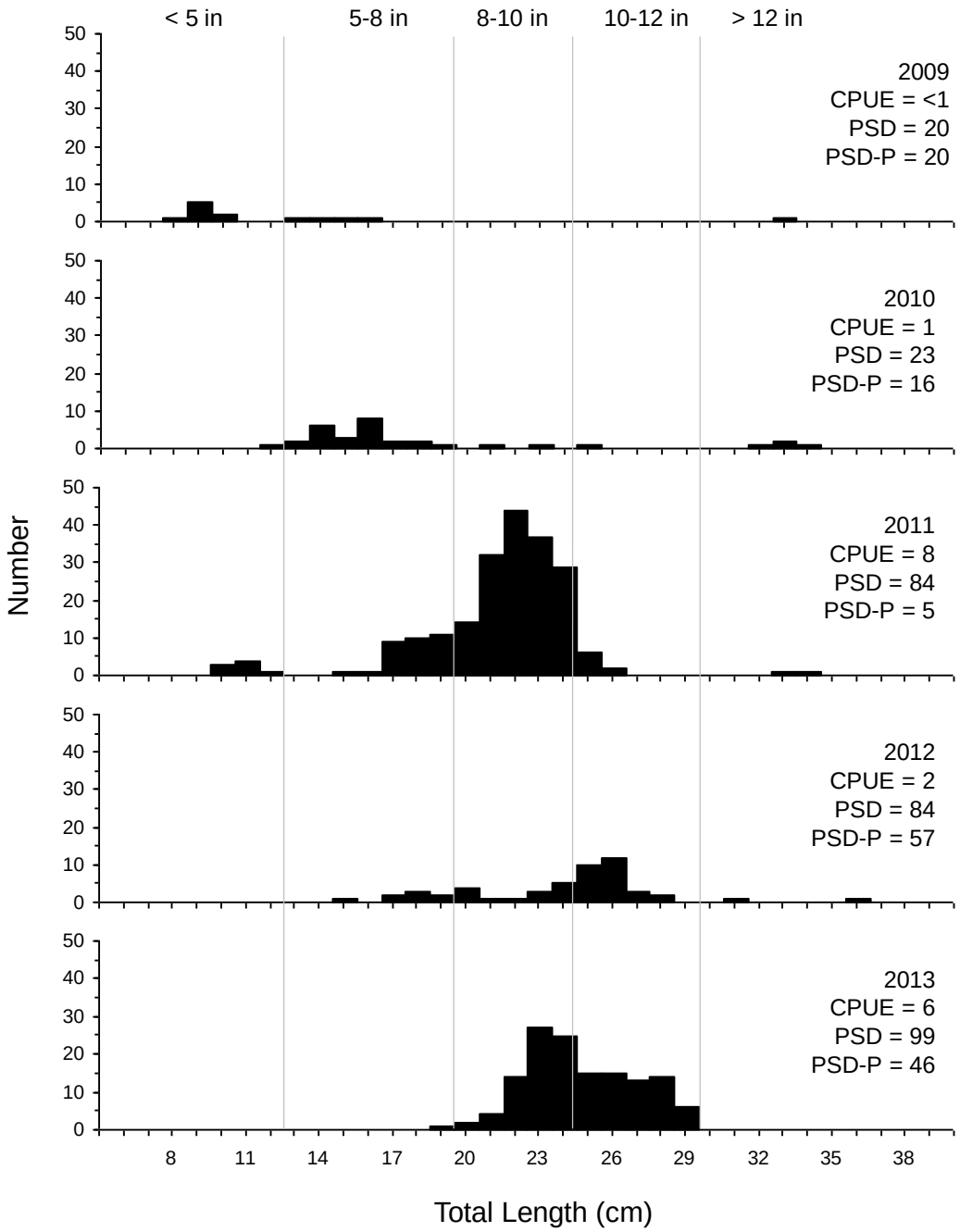

Figure 3. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Black Crappie captured using frame nets in Enemy Swim Lake, 2009-2013.

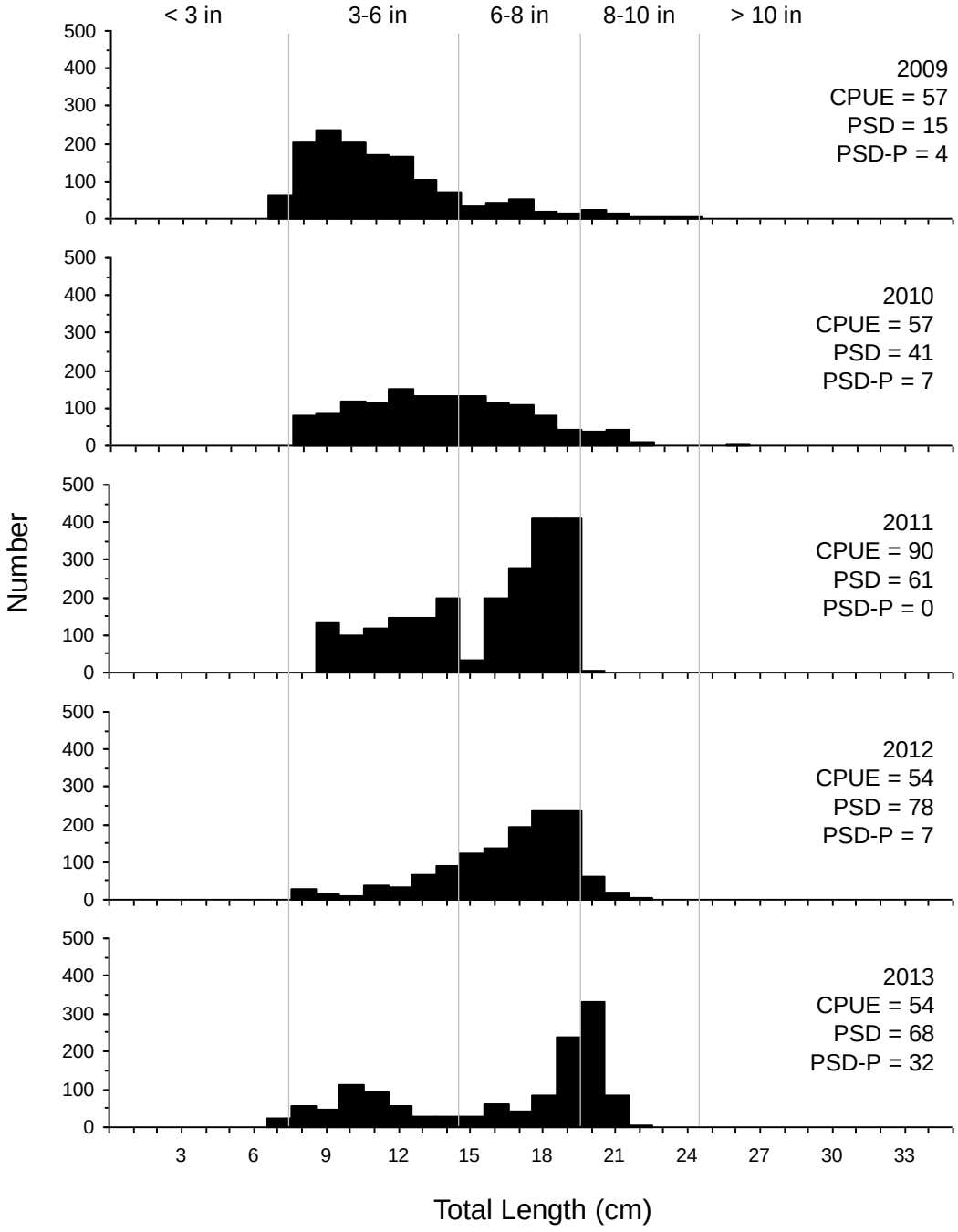

Figure 4. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Bluegill captured using frame nets in Enemy Swim Lake, 2009-2013.

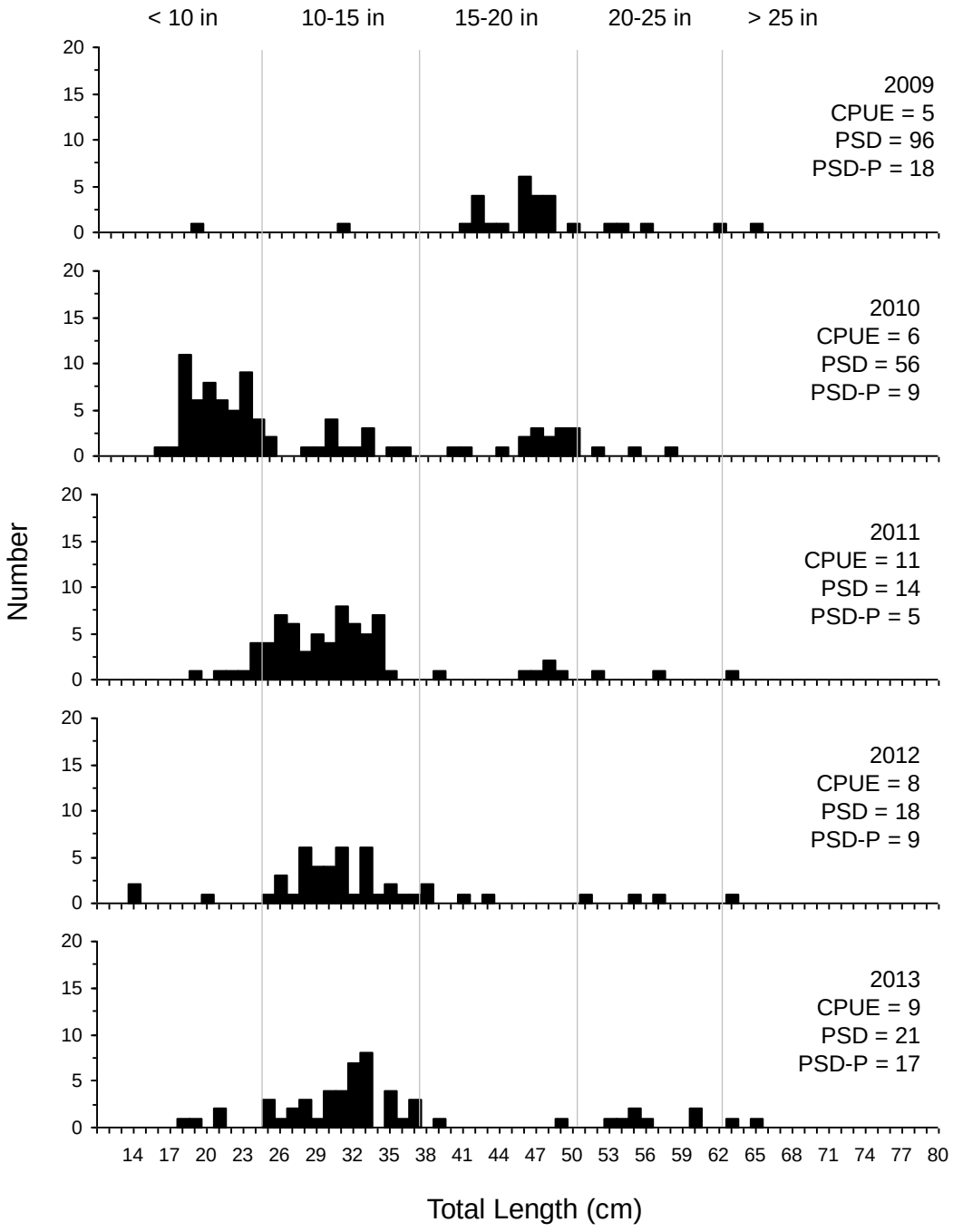

Figure 5. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Walleye captured using gill nets in Enemy Swim Lake, 2009-2013.

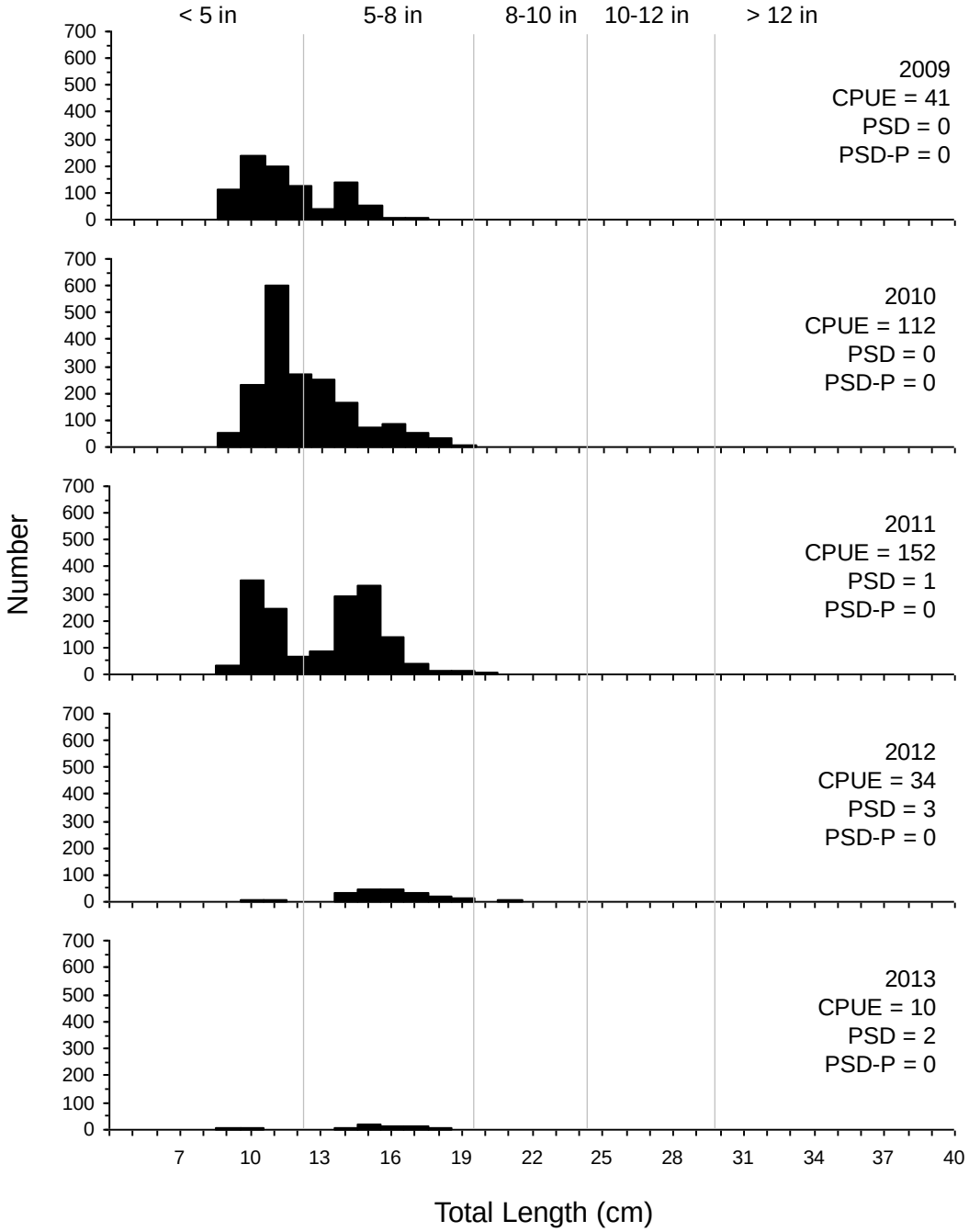

Figure 6. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Yellow Perch captured using gill nets in Enemy Swim Lake, 2009-2013.

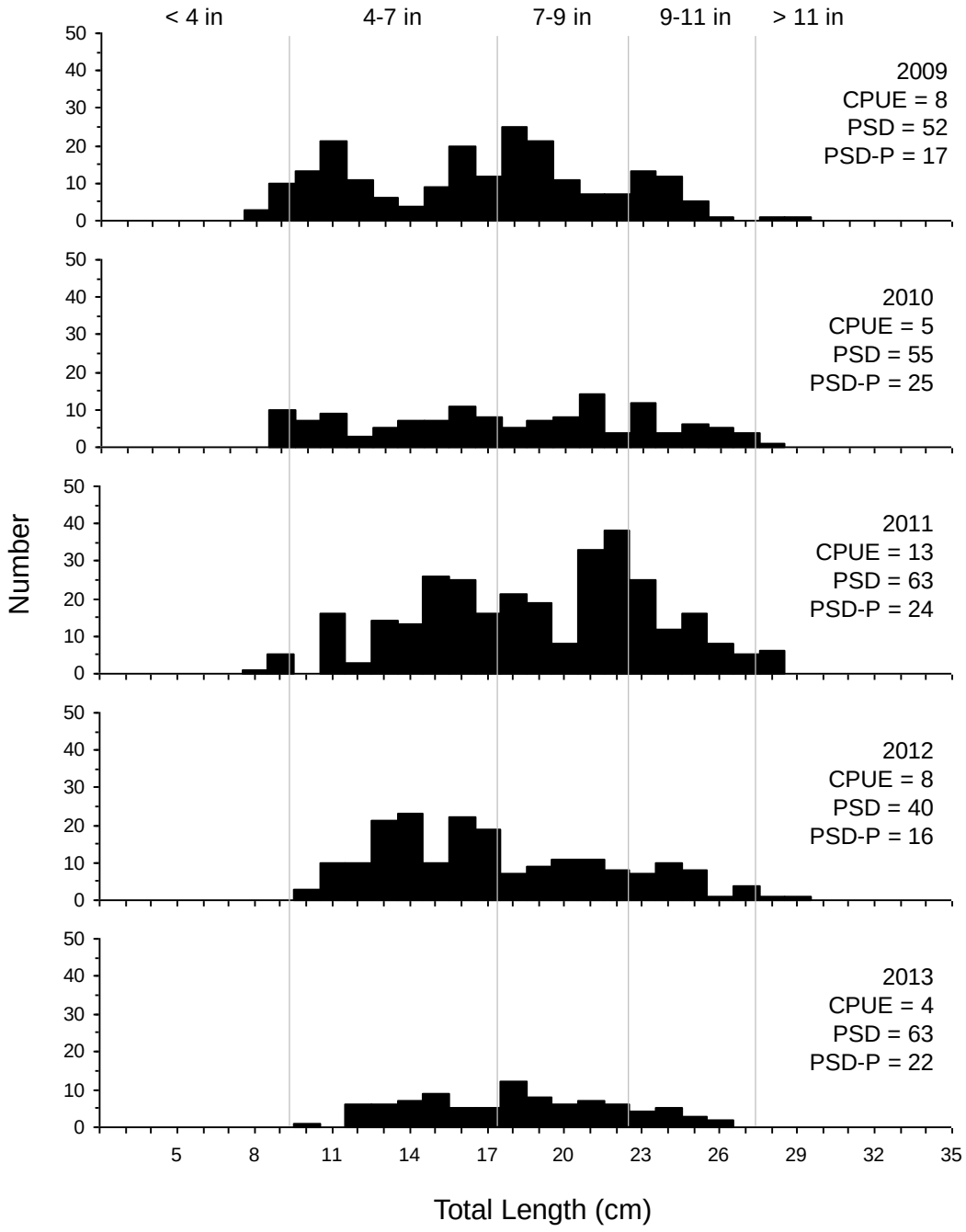

Figure 7. Length-frequency histogram, catch rate of stock-length fish (CPUE), proportional size distribution of quality- (PSD) and preferred-length (PSD-P) fish for Rock Bass captured using frame nets in Enemy Swim Lake, 2009-2013.